However, since a part of the surface of the optical card is occupied additionally by the tracking tracks, the recording capacity per unit area is necessarily decreased. Obviously, the effective area for recording in the second optical card **41** is smaller than that in the first example shown in FIG. **1**.

SUMMARY OF THE INVENTION

Accordingly it is a general object of the present invention to overcome the drawbacks of the prior art as mentioned above.

More specifically it is a principal object of the invention to provide an optical information recording medium which enables correct auto-tracking without decreasing the recording capacity per unit area, and to provide apparatus for recording/reproducing information in and from the recording medium.

According to the present invention, the above object is attained by an optical information recording medium in the form of a card having alternate lines of tracking track and clock track previously formed for obtaining a tracking signal and a clock signal, and recording zones useful for recording information provided between every two lines of the tracks. The present invention provides also an apparatus for recording/reproducing information using the recording medium.

Other and further objects, features and advantages of the invention will appear more fully from the following description taken in connection with the accompanying drawings.

BRIEF DESCRIPTION 0F THE DRAWINGS

FIG. **1A** is a schematic plan view of a first example of the prior art optical card and FIG. **1B** is an enlarged view thereof showing how to record information on the card;

FIG. **2A** is a schematic plan view of a second example of the prior art optical card and FIG. **2B** is an enlarged view thereof showing how to record information on the card;

FIG. **3** is a schematic plan view of an embodiment of the optical card according to the present invention;

FIG. **4** is a perspective view of an embodiment of the apparatus for recording/reproducing information according to the present invention;

FIG. **5** is a sectional side view of the recording/reproducing apparatus;

FIG. **6** is a view illustrating the construction of the photo detector in the embodiment of the apparatus;

FIG. **7** is an enlarged view of the embodiment of the optical card showing how to record information on it;

FIG. **8** is a view illustrating the principle of the autofocusing in the embodiment of the apparatus;

FIG. **9** is an enlarged view of the embodiment of the optical card showing how to reproduce the information recorded in it;

FIG. **10** is a block diagram showing a concrete form of the signal processing system in the embodiment of the apparatus;

FIG. **11** is a view showing the construction of the photo detector in a modification of the above embodiment of the apparatus;

FIG. **12** is an enlarged view of the optical card showing how to reproduce the recorded information according to the modification; and

FIG. **13** is a block diagram showing a concrete form of the signal processing system in the modification.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

An embodiment of the optical card according to the present invention is schematically shown in FIG. **3**.

The optical card **1** has alternate lines of clock track **2** and tracking track **3** previously formed on the optical card. The track lines are arranged regularly with equal spaces which provide recording zones 4_1, 4_2, 4_3, . . . for recording information therein. The clock tracks 2_1, 2_2, 2_3, . . . are in the form of a broken line on which clock signals have been previously recorded intermittently at certain constant periods. The tracking tracks 3_1, 3_2, 3_3, . . . are in the form of unbroken line from which a tracking signal can be obtained.

In this optical card according to the invention, every recording zone lies between every two lines, i.e. between a clock track and a tracking track. Therefore, this optical card has a large effective area for recording sufficient information to obtain substantially the same recording density as that obtained by the first example of the prior art shown in FIG. **1**. In addition, this optical card according to the invention has also a tracking track provided for producing a tracking signal, which assures very precise and correct auto-tracking.

An embodiment of the recording/reproducing apparatus using the above optical information recording medium is shown in a perspective view in a FIG. **4** and in sectional side view in FIG. **5**.

In the apparatus a beam of light is emitted from a light source **11** and collimated by a collimater lens **12**. The beam is then split into three beams by a diffraction grating. These beams enter an objective lens **14** which focuses these three beams on the surface of an optical card **1** as shown in FIG. **3**. Thus, three beam spots S_1, S_2 and S_3 are formed on the optical card **1**. The optical card is being moved in the direction of arrow R by driving means not shown. With this movement, the surface of the optical card **1** is scanned by the beam spots in the direction in which the tracking and clock tracks extend.

The reflected beams of the beam spots S_1, S_2 and S_3 from the card surface enter again the objective lens which transmits the reflected beams to a mirror **15**. The mirror reflects the three beams toward a condenser lens **16** through which the reflected beams are projected on photo detectors **17**, **18**, **19** arranged on the focal plane of the lens. As shown in FIG. **6**, the three photo detectors are in alignment with Z-axis. Further, the light-receiving surfaces of the photo detectors **17** and **18** are divided into four sections A, B, C and D.

The manner of recording information on the optical card will be described with reference to FIG. **7** which is an enlarged view of the record side surface of the optical card. For the sake of explanation it is assumed that the apparatus is now recording a piece of information in the recording zone 4_1.

The beam spots S_1, S_2 and S_3 are being projected on the clock track 2_1, recording zone 4_1 and tracking track 3_1 respectively. As, previously mentioned, the optical card **1** is moved by driving means, these spots scan the card in the direction of arrow a (scanning direction). In the manner previously described, the reflected light of the spot S_1 is projected on the photo detector **17** to reproduce a clock signal. The reflected light of the spot S_3 enters the photo detector **19** to detect a tracking signal according to the so-called push-pull method. To this end, the light-receiving surface of the photo detector **19** is divided into area A+C and area B+D by a